

PATENT ABSTRACTS OF JAPAN

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(54) INFORMATION PROVIDING METHODINFORMATION RECEIVING
METHODINFORMATION PROVIDING DEVICEAND INFORMATION RECEIVING
DEVICE

(57)Abstract:

PURPOSE: To send prescribed information on transmission request from plural terminal equipments simultaneously.

CONSTITUTION: When plural terminal equipments 2 make a transmission request via a public channel network 4 on prescribed information such as musicmovie or game programs stored in a center 1the center 1 sends a transmission start time and a transmission end time of prescribed information on the transmission request to each terminal equipment 2 respectively via the public channel network 4. When the transmission start time comesthe center 1 sends the information via a broadcast satellite 3 and each terminal equipment 2 receives respectively the information via the broadcast satellite 3. When the transmission end time comesthe center 1 finishes the transmission of the information and each terminal equipment 2 finishes the reception of the information.

CLAIMS

[Claim(s)]

[Claim 1]To a terminalinformation in an information service method to provide from a center said centerMemorize said information and said center caters to a Request to Send from said terminalCreate a transmitting schedule of a predetermined thing of said informationtransmit to said terminal via a

predetermined communication line and said transmitting schedule said center An information service method transmitting a predetermined thing of said information to said terminal via a predetermined transmission medium to predetermined timing based on said transmitting schedule.

[Claim 2] The information service method according to claim 1 wherein said transmission medium is a broadcasting electric-wave.

[Claim 3] In an information receiving method to receive from a center information transmitted to a terminal a predetermined thing of said terminal Perform a Request to Send via a predetermined communication line and so that said information may be transmitted to said center a predetermined thing of said terminal An information receiving method wherein it receives a transmitting schedule of said information from said center and a predetermined thing of said terminal receives said information from said center via a predetermined transmission medium based on said transmitting schedule to predetermined timing.

[Claim 4] The information receiving method according to claim 3 wherein said transmission medium is a broadcasting electric-wave.

[Claim 5] An information providing device which provides information from a center to a terminal comprising:

A memory measure which memorizes said information.

A reception means which receives a Request to Send from said terminal.

A scheduling means to create a transmitting schedule of a predetermined thing of said information corresponding to said Request to Send.

A transmitting means which transmits said transmitting schedule created by said scheduling means to said terminal via a predetermined communication line.

An information transmission means which transmits a predetermined thing of said information to said terminal via a predetermined transmission medium based on said transmitting schedule to predetermined timing.

[Claim 6] The information providing device according to claim 5 wherein said scheduling means judges whether a transmitting schedule corresponding to a predetermined thing of said information by which the Request to Send was carried out from said terminal is already created and creates said transmitting schedule based on said decision result.

[Claim 7] A scramble key preparing means which creates a scramble key corresponding to a predetermined thing of said information An encryption scramble key preparing means which creates an encryption scramble key which enciphered said scramble key based on a terminal inherent key corresponding to an identification number of said terminal Have further an encoding means which creates encipherment information which enciphered a predetermined thing of said information based on said scramble key and said transmitting means The information providing device according to claim 5 wherein it transmits said encryption scramble key to said terminal via said communication line and said information transmission means transmits said encipherment information to said terminal via said transmission medium based on said transmitting schedule to said

predetermined timing.

[Claim 8]The information providing device according to claim 5 passing said communication line and performing bidirectional information transmission between said center and said terminal by said reception means and said transmitting means.

[Claim 9]The information providing device according to claim 5wherein said transmission medium is a broadcasting electric-wave.

[Claim 10]The information providing device according to claim 5 having further a compression means which compresses said information.

[Claim 11]The information providing device according to claim 5 having further a multiplexing means which multiplexes said information.

[Claim 12]The information providing device according to claim 5wherein said transmitting schedule consists of predetermined transmission start time and sending-out finish time of a thing of information by which the Request to Send was carried out at least with said terminal.

[Claim 13]The information providing device according to claim 5wherein said information is information with a hour entry of music or an animation.

[Claim 14]An information reception device which receives information transmitted to a terminal from a centercomprising:

A Request-to-Send means to perform a Request to Send via a predetermined communication line so that said information may be transmitted to said center.

A reception means which receives a transmitting schedule of said information from said center.

An information receiving means which receives said information from said center via a predetermined transmission medium based on said transmitting schedule to predetermined timing.

[Claim 15]A descrambling key preparing means which descrambles an encryption scramble key from said center received by said reception means based on a terminal inherent key of said terminaland creates a descrambling keyThe information reception device according to claim 14 having further a descrambling means to descramble said information enciphered from said center based on said descrambling key created by said descrambling key preparing means.

[Claim 16]The information reception device according to claim 14wherein said Request-to-Send means and said reception means perform bidirectional information transmission between said centers via said communication line.

[Claim 17]The information reception device according to claim 14wherein said transmission medium is a broadcasting electric-wave.

[Claim 18]The information reception device according to claim 14wherein said transmitting schedule consists of transmission start time and sending-out finish time of said information by which the Request to Send was carried out at least with said terminal.

[Claim 19]According to a recording device which records predetermined informationand said transmitting schedule transmitted from said centerThe information reception device according to claim 14 or 18 having further a control

means which makes said transmission start time start record to said recording device of said information and makes it end record to said recording device of said information at said sending-out finish time.

[Claim 20] The information reception device according to claim 14 having further an extension means which elongates said information.

[Claim 21] The information reception device according to any one of claims 14 to 20 wherein said information is information with a hour entry of music or an animation.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] When this invention provides music information etc. by broadcasting media such as a satellite it is used for example and it relates to a suitable information service method and an information receiving method and an information providing device and an information reception device.

[0002]

[Description of the Prior Art] Now as a method of obtaining desired music people go to 1. record shop purchase storage media such as CD or MD and view and listen to this.

2. Record the music of here to viewing and listening or a request of broadcasting media such as FM broadcasting or cable broadcasting and view and listen to this. How to say can be considered.

[0003] In the future as one of the applications in the high-speed communications network represented by B-ISDN (Broadband Integrated Services Digital Network) The video-on-demand (it is hereafter written as VOD) service which can view and listen to the animation and music information accumulated in the predetermined center via this communications network is considered now.

[0004]

[Problem(s) to be Solved by the Invention] However when going to a record shop purchasing storage media such as CD or MD and viewing and listening to this SUBJECT with troublesome going to a record shop occurred. The case in which it is difficult to go to a record shop depending on the case was also considered further in the case of the popular title it may be sold out and SUBJECT which may be unable to obtain a record certainly occurred.

[0005] In the case so that it may view and listen to broadcasting media such as FM broadcasting or cable broadcasting or desired music may be recorded from here. When it had to wait until desired music flowed and it was recorded further preparation for recording and sound recording operation had to be carried out it is inefficient-like in time and troublesome SUBJECT occurred.

[0006] Then in VOD although it was possible to provide the music information by VOD in order to use a communications network for transmission of

informationSUBJECT to which communication cost becomes large occurred.

SUBJECT with which the telecom infrastructure which has at present the capability for VOD to be applicable is not fixed occurred.

[0007]Like a hard diskrandom access is possible to the center apparatus which sends out the accumulated informationand the archive medium which can be read at high speed is needed for it. HoweverSUBJECT that such an information storing device was dramatically expensivetherefore the initial investment to the hardware for starting service was large occurred.

[0008]The more users increased in numberthe load of the center apparatus became large andthe more SUBJECT for which the additional investment for it is needed occurred.

[0009]This invention is made in view of such a situationand enables it for desired music to come to hand simplyefficientlyand certainly. Without using an expensive communications networkthe initial investment of hardware can be made smallincrease of the load of the system by the increase in a user can be suppressedand it enables it to control an additional investment by this by building a system with a cheap device.

[0010]

[Means for Solving the Problem]In an information service method to providethe information service method according to claim 1 information from a center to a terminal a centerMemorize informationcreate a transmitting schedule of a predetermined thing of information corresponding to a Request to Send from a terminaltransmit a transmitting schedule to a terminal via a communication lineand a predetermined thing of information based on a transmitting schedule to predetermined timing. It transmits to a terminal via a predetermined transmission medium.

[0011]A transmission medium can be made into a broadcasting electric-wave.

[0012]In an information receiving method to receivethe information receiving method according to claim 3 from a center information transmitted to a terminal a predetermined thing of a terminalPerform a Request to Send via a predetermined communication lineand so that information may be transmitted to a center a predetermined thing of a terminalReceiving a transmitting schedule of information from a centera predetermined thing of a terminal receives information from a center via a predetermined transmission medium based on a transmitting schedule to predetermined timing.

[0013]A transmission medium can be made into a broadcasting electric-wave.

[0014]The information providing device according to claim 5 is [this invention] characterized by that an information providing device which provides information comprises the following from a center to a terminal.

A memory measure which memorizes information (for examplemusic accumulating part 11 of drawing 2).

A reception means which receives a Request to Send from a terminal (for examplemodem 20 of drawing 2).

A scheduling means to create a transmitting schedule of a predetermined thing of

information corresponding to a Request to Send (for example CPU 17 of drawing 2).
A transmitting means (for example modem 20 of drawing 2) which transmits a transmitting schedule created by a scheduling means to a terminal via a predetermined communication line (for example public network 4 of drawing 2).
An information transmission means which transmits a predetermined thing of information to a terminal via a predetermined transmission medium (for example broadcasting electric-wave) based on a transmitting schedule to predetermined timing (for example antenna 25 of drawing 2).

[0015] A transmitting schedule corresponding to a predetermined thing of information by which the Request to Send was carried out from a terminal judges whether it is already created and the scheduling means can create a transmitting schedule based on this decision result.

[0016] A scramble key preparing means (for example CPU 17 of drawing 2) which creates a scramble key corresponding to a predetermined thing of information.
An encryption scramble key preparing means (for example CPU 17 of drawing 2) which creates an encryption scramble key which enciphers a scramble key based on a terminal inherent key corresponding to an identification number of a terminal.
Establish further an encoding means (for example scramble processing section 13 of drawing 2) which creates encipherment information which enciphers a predetermined thing of information based on a scramble key and a transmitting means.
An encryption scramble key is transmitted to a terminal via a predetermined communication line and the information transmission means can transmit encipherment information to a terminal via a predetermined transmission medium based on a transmitting schedule to predetermined timing.

[0017] By reception means and a transmitting means a communication line is passed and bidirectional information transmission can be performed between a center and a terminal.

[0018] A transmission medium can be made into a broadcasting electric-wave.

[0019] A compression means (for example information-compression part 12 of drawing 2) which compresses information can be established further.

[0020] a multiplexing means (for example multiplex processing section 14 of drawing 2) which multiplexes information — it can provide further.

[0021] The transmitting schedule can consist of predetermined transmission start time and sending-out finish time of a thing of information by which the Request to Send was carried out at least with a terminal.

[0022] Information can be made into information with a hour entry of music or an animation.

[0023] As for this invention the information reception device according to claim 14 is characterized by that an information reception device which receives information transmitted to a terminal from a center comprises the following.

A Request-to-Send means to perform a Request to Send via a predetermined communication line (for example public network 4 of drawing 3) so that a predetermined thing of information may be transmitted to a center (for

example CPU 38 of drawing 3).

A reception means which receives a transmitting schedule from a center (for example modem 41 of drawing 3).

An information receiving means which receives a predetermined thing of information from a center via a predetermined transmission medium based on a transmitting schedule to predetermined timing (for example the antenna 31 of drawing 3 the tuner 32).

[0024] A descrambling key preparing means (for example descrambler 34 of drawing 3) which descrambles an encryption scramble key from said center based on a terminal inherent key of a terminal and creates a descrambling key. A descrambling means (for example descrambler 34 of drawing 3) to descramble encipherment information based on said descrambling key created by descrambling key preparing means can be formed further.

[0025] By Request-to-Send means and a reception means a communication line is passed and bidirectional information transmission can be performed between a center and a terminal.

[0026] A transmission medium can be made into a broadcasting electric-wave.

[0027] The transmitting schedule can consist of predetermined transmission start time and sending-out finish time of a thing of information by which the Request to Send was carried out at least with a terminal.

[0028] A recording device (for example music recorder 36 of drawing 3) which records predetermined information. According to a transmitted transmitting schedule from a center at a transmission start time. A control means (for example music recorder control section 37 of drawing 3) which makes record to a recording device of a predetermined thing of information start and makes sending-out finish time end record to a recording device of a predetermined thing of information can be established further.

[0029] An extension means (for example compression signal decoding part 35 of drawing 3) which elongates information can be established further.

[0030] Information can be made into information with a hour entry of music or an animation.

[0031]

[Function] In the information service method according to claim 1 a center. If the Request to Send of the predetermined thing of information is received from a terminal via a predetermined communication line. The transmitting schedule of the predetermined thing of the information transmitted to a terminal is created. It is transmitted to a terminal via a communication line and a center transmits the predetermined thing of information to a terminal to predetermined timing based on a transmitting schedule. Therefore the predetermined information by which the Request to Send was carried out can be simultaneously transmitted to predetermined time from two or more terminals to two or more terminals.

[0032] Let a transmission medium be a broadcasting electric-wave in the information service method according to claim 2. Therefore information can be

provided using the existing broadcasting media.

[0033]In the information receiving method according to claim 3to a center a terminal performs the Request to Send of predetermined information via a predetermined communication line receives the transmitting schedule of that information from a center and receives the information from a center to predetermined timing based on this transmitting schedule. Therefore the terminal can acquire the predetermined information which carried out the Request to Send to the center at predetermined time.

[0034]Let a transmission medium be a broadcasting electric-wave in the information receiving method according to claim 4. Therefore information is receivable via the existing broadcasting media.

[0035]In the information providing device according to claim 5 corresponding to the Request to Send from the terminal received by the modem 20 by CPU 17. The transmitting schedule of the predetermined thing of the information memorized by the music accumulating part 11 is created it is transmitted to a terminal via the modem 20 and the public network 4 and the predetermined thing of information is transmitted to a terminal via a transmission medium based on a transmitting schedule to predetermined timing. Therefore the predetermined thing of the information by which the Request to Send was carried out can be simultaneously transmitted to predetermined time from two or more terminals to two or more terminals.

[0036]In the information providing device according to claim 6 the transmitting schedule corresponding to the predetermined thing of the information in which the Request to Send was carried out by CPU 17 from the terminal When have not been created yet and a transmitting schedule is created and the transmitting schedule is already created a new transmitting schedule is not created. Therefore utility can be excluded.

[0037]In the information providing device according to claim 7 the scramble key corresponding to the predetermined thing of information is created by CPU 17 It is created by the encryption scramble key with which the scramble key was enciphered based on the terminal inherent key corresponding to the identification number of a terminal and with the modem 20. It is transmitted to a terminal via a communication line and the encipherment information as which the predetermined thing of information was enciphered by the scramble processing section 13 based on the scramble key is created and it is transmitted to a terminal via a predetermined transmission medium by the antenna 25. Therefore only a predetermined terminal can descramble the received encipherment information.

[0038]In the information providing device according to claim 8 with the modem 20 the public network 4 is passed and bidirectional information transmission is performed between a center and a terminal. Therefore the center can exchange information individually between predetermined terminals.

[0039]Let a transmission medium be a broadcasting electric-wave in the information providing device according to claim 9. Therefore predetermined information can be simultaneously transmitted from a center to two or more

terminals.

[0040]In the information providing device according to claim 10information is compressed by the information-compression part 12. Thereforemany information can be transmitted.

[0041]In the information providing device according to claim 11it carries out multiplex [of two or more information] by the multiplex processing section 14. Thereforeseveral different information can be transmitted simultaneously.

[0042]A transmitting schedule consists of the predetermined transmission start time and sending-out finish time of a thing of the information by which the Request to Send was carried out at least with the terminal in the information providing device according to claim 12. Thereforea terminal can be told about the predetermined transmission start time and sending end time of a thing of information.

[0043]Let information be information with the hour entry of music or an animation in the information providing device according to claim 13. Thereforevarious information can be transmitted.

[0044]In the information reception device according to claim 14If CPU38 performs a Request to Send via the predetermined public network 4 so that predetermined information may be transmitted to a centerThe transmitting schedule from a center is received via the modem 41and the information from a center is received by the antenna 31 and the tuner 32 to predetermined timing based on this transmitting schedule. Thereforethe predetermined information which carried out the Request to Send is acquirable at predetermined time.

[0045]In the information reception device according to claim 15The encryption scramble key from a center is descrambled by the descrambler 34 based on the terminal inherent key of a terminala descrambling key is created and the encipherment information from a center is descrambled by the descrambler 34 based on this descrambling key. Thereforeonly a predetermined terminal can descramble the encipherment information from a center.

[0046]In the information reception device according to claim 16with CPU38 and the modem 41the public network 4 is passed and bidirectional information transmission is performed between a center and a terminal. Thereforethe terminal can transmit predetermined information to a center and can receive the individual information over each terminal from a center.

[0047]Let a transmission medium be a broadcasting electric-wave in the information reception device according to claim 17. Thereforepredetermined information is receivable via the existing broadcasting media.

[0048]A transmitting schedule consists of the predetermined transmission start time and sending-out finish time of information by which the Request to Send was carried out at least with the terminal in the information reception device according to claim 18. Thereforethe terminal can know the transmission start time and sending end time of the predetermined information transmitted from a center.

[0049]In the information reception device according to claim 19by control of CPU38the music recorder 36 records the predetermined information transmitted

to predetermined transmission start time from the center according to the transmitting schedule transmitted from the center and ends record at predetermined sending-out finish time. Therefore the predetermined information transmitted from the center is recordable.

[0050] In the information reception device according to claim 20 information is elongated by the compression signal decoding part 35. Therefore the compressed information can be restored to the original information.

[0051] Let information be information with the hour entry of music or an animation in the information reception device according to claim 21. Therefore the terminal can receive various information.

[0052]

[Example] Hereafter working example of this invention is described referring to Drawings. Drawing 1 is a figure showing the composition of one working example of the music providing system which applied the information service method of this invention and the information receiving method. In drawing 1 the center 1 stores music information and the terminal 2 is installed in each home. It is possible to transmit predetermined information to the terminal 2 with the broadcasting satellite 3 from the center 1 and it is possible between the center 1 and the terminal 2 to transmit information bidirectionally with the public network 4.

[0053] Drawing 2 is a block diagram showing the composition of one working example of the center which applied the information providing device of this invention. As shown in drawing 2 the center 1 the information-compression part 12 which performs the information compression for transmitting more efficiently the music accumulating part 11 and music information which accumulated the music which should be served and music information. It provides only for the terminal 2 which required it. By the music storage device control section 15 for controlling the multiplex processing section 14 for carrying out Time Division Multiplexing of the scramble processing section 13 to which the scramble for preventing viewing and listening with the arbitrary terminals 2 is applied and two or more music information and the music accumulating part 11 which comprises two or more music storage devices and two or more scramblers. It has CPU 17 which executes the scrambler control section 16 for controlling the scramble processing section 13 constituted and a control program.

[0054] The sending-out schedule based on the demand from the terminal 2 in the center 1. The modem 20 for exchanging the information on the terminal 2 via ROM 19 which stored RAM 18 which saves a scramble key and the accounting information to each terminal 2 a control program and terminal information and the public network 4 a data bus. The antenna 25 and clock which transmit the output signal from the modulation processing part 23 and the modulation processing part 23 which carries out multiplex [of the system bath 21 of CPU 17 which consists of an address bus a control bus etc. and the music information outputted from the multiplex processing section 14 and the video audio information of satellite broadcasting] and is modulated are built in. It comprises the timer 24 which can notify the present time.

[0055]The music accumulating part 11 is constituted by 16 sets of CD changers 101 thru/or 116 (howeverthe part has omitted the graphic display)and the output is inputted into 16 sets of the MPEG/Audio encoders 201 thru/or 216 (howeverthe part has omitted the graphic display) of the information-compression part 12respectively. By passing this information-compression part 12the audio signal of 16 bitsa 44.1-kHz samplingand 1.4Mbps of a stereo is compressed into 128k bps. The output of the information-compression part 12 is inputted into 16 sets of the scramblers 301 thru/or 316 (howeverthe part has omitted the graphic display) of the scramble processing section 13respectivelyand encryption processing is made.

[0056]As for the output of the scramble processing section 13time division multiple processing is made in the multiplex processing section 14and 16 audio signals which are 128k bps are packed into one signal of 2Mbps. It is inputted into the modulation processing part 23and multiplex is carried out to the usual video voice signalit becomes irregular hereand the output of the multiplex processing section 14 is sent to the broadcasting satellite 3 through the antenna 25. And the broadcasting satellite 3 transmits the predetermined signal transmitted via the antenna 25 to the terminal 2.

[0057]If it assumes that the average number of hours of the music to serve is 5 minutes in the case of this working exampleit is possible to transmit 4608 music in 24 hours. When the number of the music by which this was accumulated in the music accumulating part 11 is 4608even when a user is the worsthe means that it is possible for desired music to come to hand in 24 hours. The number of 4600 music is equivalent to the number of music served in the general karaoke boxand it can be said that it is a number in which the user who joins service can be satisfied enough.

[0058]Drawing 3 is a block diagram showing the composition of one working example of the terminal which applied the information reception device of this invention. The terminal 2 recovers the signal corresponding to a predetermined channel from the antenna 31 for receiving the satellite broadcasting from the broadcasting satellite 3and an input signalFrom the tuner 32 which furthermore extracts only a digital signaland the signal with which multiplex [of two or more music information] was carried out. Only the target music information. The multiple-signal separation part 33 to take out and the signal by which scramble processing was carried out. It has the music recorder control section 37 for controlling the music recorder 36 for recording the compression signal decoding part 35 for returning the descrambler 34 for returningand the signal by which the information compression was carried out to the original musicand the restored musicand the music recorder 36.

[0059]The terminal 2It goes via RAM39 which saves the transmission start time and sending-out finish time of CPU38 for executing a control programand the demanded informationand a descrambling keyROM40 which store a control programand the public network 4. The modem 41 for exchanging the information on the center 1a data busAn address busAmplifier for a user to view and listen to the

music recorded on the indicator 44 for telling a user about the input part 43 for the system bath 42 of CPU38 which consists of control buses etc. and a user to demand information from the terminal 2 and the state of the information from the center 1 or the terminal 2 and the music recorder 36. And the music reproduction section 45 which consists of loudspeakers etc. and a clock are built in and it comprises the timer 46 which can notify the present time.

[0060] The signal corresponding to the electric wave of the satellite broadcasting received with the antenna 31 is sent to the tuner 32 and the signal of the target frequency restores to it. Furthermore a video voice signal is separated and the digital signal of 2Mbps is extracted. This signal is inputted into the multiple-signal separation part 33 and one of 16 128k bps signals by which Time Division Multiplexing was carried out is separated. The output of the multiple-signal separation part 33 is inputted into the descrambler 34 and the enciphered information is restored.

[0061] The output of the descrambler 34 is inputted into the compression signal decoding part 35 and the signal compressed into 128k bps is restored to the digital sound signal of 16 bits of a basis 44.1-kHz sampling and 1.4Mbps of a stereo. The output of the compression signal decoding part 35 is inputted into the music recorder 36 and is recorded on MD. Therefore a user becomes possible [viewing and listening to the music information recorded on the music recorder 36 freely via the music reproduction section 45].

[0062] Next with reference to the flow chart shown in drawing 4a procedure in case the terminal 2 performs the Request to Send of desired music to the center 1 is explained. In [if first a user inputs the music name of desired music into the terminal 2 via the input part 43] Step S101 CPU38 controls the modem 41 performs the modem 20 and line connection in the center 1 transmits terminal ID peculiar to a terminal accumulated in the music ID and ROM 40 corresponding to the music name of desired music to the center 1 and performs the Request to Send of the music corresponding to the music ID concerned.

[0063] In [if the Request to Send from the terminal 2 is received in the center 1] Step S102 The transmitting schedule in this time stored in RAM 18 is searched by CPU 17 in the center 1 and it is judged whether the music corresponding to music ID demanded from the terminal 2 is already constructed in the transmitting schedule.

[0064] When it judges that the music ID concerned does not enter during a schedule it progresses to Step S103 and the music demanded from the terminal 2 is newly added to the schedule in RAM 18 by CPU 17.

[0065] Next in Step S104 the scramble key for enciphering and transmitting the music newly constructed by the schedule by CPU 17 is created and this is also stored in RAM 18 and he follows it to Step S105.

[0066] In Step S105 the terminal information in ROM 19 is searched by CPU 17 and a terminal inherent key is searched from terminal ID sent from the terminal 2.

[0067] Next in Step S106 the scramble key for enciphering the music concerned is enciphered based on the terminal inherent key searched by CPU 17 in Step

S105 and the enciphered encryption scramble key is created.

[0068] Next in Step S107 CPU17 transmits schedule information which the music concerned multiplexes such as a channel transmission start time and sending end time and an encryption scramble key to the terminal 2 via the modem 20. At the terminal 2 via the modem 41 schedule information and an encryption scramble key are received and CPU38 is supplied. And CPU38 supplies the schedule information and the encryption scramble key which were supplied from the modem 41 to RAM39. RAM39 memorizes an encryption scramble key while memorizing this schedule information as a receiving schedule.

[0069] On the other hand in Step S102 the music information required by CPU17 with the terminal 2. Since the scramble key for the music information should already be created when it is not necessary to perform new schedule setting out and the transmitting schedule is constructed when judged with already being constructed by the transmitting schedule. Progressing to Step S111 CPU17 searches the scramble key concerned from RAM18. After that it shifts to Step S105 like the above-mentioned procedure.

[0070] The example of the transmitting schedule constructed by the above-mentioned procedure is shown in drawing 5. Thus the transmitting schedule of each music in each of the channels 1 thru/or 16 is memorized. By music since it is various the length of one music becomes various as the musical transmission start time and sending end time of each channel were shown in drawing 5.

[0071] Next with reference to the flow chart shown in drawing 6 the transmission procedure of the music in the center 1 is explained. In Step S201 the present time is acquired from the timer 24 it progresses to Step S202 and CPU17 compares with the transmission start time of the music of the transmitting schedule memorized by RAM18. If it has not reached at transmission start time yet it returns to Step S201 again and repeat execution of Step S201 and Step S202 is carried out.

[0072] In Step S202 supposing the present time reaches at the transmission start time of the music 3-2 of the channel 3 of drawing 5 in Step S203 for example CPU17 the scramble key created to the music concerned is taken out from RAM18 a scramble key is sent out to the scrambler 303 via the scrambler control section 16 in the scrambler corresponding to the channel 3 in the scramble processing section 13 and this case and the scrambler 303 is operated. Since the same may be said of the music of other channels the explanation is omitted.

[0073] Next in Step S204 CPU17 points to playback of the music concerned via the music storage device control section 15 to the CD changer (in this case CD changer 103 corresponding to the channel 3) concerned of the music accumulating part 11 and CD changer 103 starts playback.

[0074] After the music concerned is changed as mentioned above into a corresponding signal by this via the music accumulating part 11 the information-compression part 12 the scramble processing section 13 the multiplex processing section 14 and the modulation processing part 23 it is transmitted to a broadcasting satellite by the electric wave with the antenna 25.

[0075] Next in Step S205 the present time is acquired from the timer 24 by CPU17 it

progresses to Step S206 and it is judged whether the present time reached at the sending end time of the music under present playback memorized by RAM18. In Step S206 when judged with the present time not having reached at sending end time yet by CPU17 it returns to Step S205 again and repeat execution of the processing of Step S205 and Step S206 is carried out.

[0076] On the other hand in Step S206 when judged with the present time having reached at sending end time it progresses to Step S207 and it is ordered CPU17 via the system bus 21 so that playback of the music concerned may be suspended to the music storage device control section 15. According to the instructions from CPU17 it is ordered the music storage device control section 15 so that playback of the music concerned may be suspended to the CD changer (in this case CD changer 103) concerned of the music accumulating part 11. CD changer 103 suspends playback of the music concerned based on the instructions from the music storage device control section 15.

[0077] Next in Step S208 CPU17 deletes the schedule information of the music concerned which ended transmission out of the transmitting schedule stored in RAM18.

[0078] Next with reference to the flow chart shown in drawing 7 the receiving procedure of the music in the terminal 2 is explained. First in Step S301 CPU38 acquires the present time from the timer 46 it progresses to Step S302 and it is judged whether it reached at the transmission start time of the music 3-2 which performed the Request to Send in the music the present time was remembered to be by RAM39 as a receiving schedule and in this case. When it judges that the present time has not reached at transmission start time yet it returns to Step S301 and repeat execution of the processing of Step S301 and Step S302 is carried out.

[0079] On the other hand in Step S302 if it judges that the present time reached at transmission start time it will progress to Step S303 and it will be ordered CPU38 to the multiple-signal separation part 33 so that only the 3rd channel may be outputted out of the time division multiplexing signal of 2Mbps. According to the instructions from CPU38 the multiple-signal separation part 33 separates the 128k bps signal corresponding to the channel 3 out of the time division multiplexing signal of 2Mbps and supplies it to the descrambler 34.

[0080] Next in Step S304 CPU38 takes out from RAM39 the encryption scramble key for the music concerned received from the center 1 via the public network 4 takes out further the terminal inherent key beforehand stored in ROM40 and supplies these two keys to the descrambler 34. The descrambler 34 controlled by CPU38 based on the encryption scramble key supplied from CPU38 and a terminal inherent key to the signal corresponding to the channel 3 supplied from the multiple-signal separation part 33 descrambling processing is performed and the signal by which descrambling processing was carried out is supplied to the compression signal decoding part 35.

[0081] Next in Step S305 to the music recorder control section 37 it is ordered CPU38 so that a recording start may be directed to the music recorder 36. It is

ordered the music recorder control section 37 so that the audio signal of 16 bits and the 44.1-kHz sampling which were supplied from the compression signal decoding part 35 and a stereo may be recorded to the music recorder 36 according to the instructions from CPU38. The music recorder 36 starts sound recording based on the instructions from the music recorder control section 37.

[0082] Thus via the antenna 31 the tuner 32 the multiple-signal separation part 33 the descrambler 34 and the compression signal decoding part 35 the predetermined music which carried out the Request to Send is supplied to the music recorder 36 and is recorded and accumulated there.

[0083] Next in Step S306 CPU38 acquires the present time from the timer 46 it progresses to Step S307 and it is judged whether the present time reached at the sending end time of the music under present sound recording in the receiving schedule memorized by RAM39. When it judges that the present time has not reached at sending end time yet it returns to Step S306 and repeat execution of the processing of Step S306 and Step S307 is carried out.

[0084] On the other hand in Step S307 when it judges that the present time reached at sending end time it progresses to Step S308 and it is ordered CPU38 so that it may direct to suspend the sound recording of this music to the music recorder 36 to the music recorder control section 37. According to the instructions from CPU38 it is ordered the music recorder control section 37 so that the sound recording of this music may be suspended to the music recorder 36. The music recorder 36 suspends the sound recording of this music according to the instructions from the music recorder control section 37.

[0085] Next in Step S309 CPU38 deletes the schedule information of the music concerned which ended sound recording out of the receiving schedule stored in RAM39.

[0086] Next the procedure of scramble descrambling for enciphering transmitting and receiving music is explained with reference to the flow chart of drawing 8 in each procedure of the above-mentioned music Request to Send music transmission and music reception.

[0087] Terminal ID peculiar to the terminal and a terminal inherent key are beforehand written in ROM40 of the terminal 2 and all the terminal ID and terminal inherent keys are matched and managed in the center 1.

[0088] In Step S401 the signal corresponding to the Request to Send of predetermined music and the signal corresponding to terminal ID are transmitted to the center 1 via the public line 4 from the terminal 2. Next in Step S402 the center 1 searches the terminal inherent key corresponding to terminal ID of the terminal 2 which received via the public line 4.

[0089] And in Step S403 the scramble key to the predetermined music by which the Request to Send was carried out in Step S401 is determined (it searches when already determined). Next in Step S404 a scramble key is enciphered with a terminal inherent key an encryption scramble key is generated and the encryption scramble key of a step S405 is transmitted to the terminal 2 via the public line 4.

[0090] After scramble processing of the music which transmits is carried out by a

scramble key and it is made into encryption music in Step S406 at the time of transmission of actual music in Step S407 it is broadcast by the broadcasting electric-wave via the broadcasting satellite 3 to the terminal 2. In [if the encryption music transmitted by the broadcasting electric-wave is received in Step S408 the terminal 2 will decrypt an encryption scramble key with a terminal inherent key and will generate a descrambling key and] Step S409 With this descrambling key descrambling processing of the encryption music which received is carried out and it takes out as actual music.

[0091] In each above-mentioned working example although music information was transmitted from the center and the case where a terminal received it was explained it is also possible to transmit software such as an animation and game software and to receive it.

[0092] In each above-mentioned working example although it was made to perform transmission of the information from a center to a terminal using the broadcasting satellite it is also possible to carry out using terrestrial broadcasting.

[0093]

[Effect of the Invention] According to the information service method according to claim 1 a center If the Request to Send of the predetermined thing of information is received from a terminal via a predetermined communication line Create the transmitting schedule of the predetermined thing of the information transmitted to a terminal and a transmitting schedule is transmitted to a terminal via a communication line Since the predetermined thing of information was transmitted to the terminal via the predetermined transmission medium based on the transmitting schedule to predetermined timing the predetermined information by which the Request to Send was carried out can be simultaneously transmitted to predetermined time from two or more terminals to two or more terminals.

Therefore since transmission of this information can be managed at a time when there is a Request to Send to the same information from two or more terminals While being able to set constant the load applied to a center irrespective of the number of terminals i.e. the number of users and making equipment of a center very cheap it becomes possible to control the additional charge by plant- and-equipment investment. Since information can be transmitted by a broadcasting electric-wave the existing infrastructure can be used and it becomes possible to reduce the cost concerning information transmission.

[0094] Since it was made to make a transmission medium into the broadcasting electric-wave according to the information service method according to claim 2 information can be provided using the existing broadcasting media. Therefore it becomes possible to hold down the cost concerning an offer of information low.

[0095] According to the information receiving method according to claim 3 a terminal Since the Request to Send of predetermined information is performed the transmitting schedule from a center is received via a predetermined communication line to a center and the information from a center was received to predetermined timing based on this transmitting schedule The terminal can acquire the predetermined information which carried out the Request to Send to the

center at predetermined time. Therefore desired music can be obtained without going to a record shop specially and since it is not possible like sale of a storage medium that it is sold-out it becomes possible for desired music to certainly come to hand.

[0096] Since it was made to make a transmission medium into the broadcasting electric-wave according to the information receiving method according to claim 4 information is receivable using the existing broadcasting media. Therefore it becomes possible to hold down the cost concerning acquisition of information low.

[0097] According to the information providing device according to claim 5 corresponding to the Request to Send from the terminal received by the reception means by a scheduling means. It is created by the transmitting schedule of the predetermined thing of the information memorized by the memory measure and by a transmitting means. A transmitting schedule is transmitted to a terminal via a communication line and the predetermined thing of this information by an information transmission means based on a transmitting schedule to predetermined timing. Since it was made to be transmitted to a terminal via a transmission medium the predetermined thing of the information by which the Request to Send was carried out can be simultaneously transmitted to predetermined time from two or more terminals to two or more terminals. Therefore it becomes possible to transmit simultaneously to all the terminals which performed the Request to Send only by transmitting predetermined information with a Request to Send to predetermined time only once.

[0098] According to the information providing device according to claim 6 a scheduling means Since it was made not to create the new transmitting schedule when the transmitting schedule corresponding to the predetermined thing of the information by which the Request to Send was carried out from the terminal had not been created yet a transmitting schedule was created and the transmitting schedule was already created utility can be excluded. Therefore the efficiency of processing can be raised.

[0099] According to the information providing device according to claim 7 by a scramble key preparing means. It is created by the scramble key corresponding to the predetermined thing of information and by an encryption scramble key preparing means. It is created by the encryption scramble key which enciphered the scramble key based on the terminal inherent key corresponding to the identification number of a terminal and by an encoding means. The predetermined thing of information is created by the encipherment information enciphered based on the scramble key and it is transmitted by a transmitting means Since an encryption scramble key is transmitted to a terminal via a predetermined communication line and the information transmission means transmitted encipherment information to the terminal via the predetermined transmission medium only a predetermined terminal can be made to descramble the transmitted encipherment information. Therefore it becomes possible to provide predetermined information for pay.

[0100] Since according to the information providing device according to claim 8 a communication line is passed and bidirectional information transmission was made

to be performed between the center and the terminal by the reception means and a transmitting means as for a center information can be individually exchanged between predetermined terminals. Therefore it becomes possible to transmit predetermined information only to a predetermined terminal.

[0101] Since it was made to make a transmission medium into the broadcasting electric-wave according to the information providing device according to claim 9 predetermined information can be simultaneously transmitted from a center to two or more terminals. Therefore it becomes possible by using the infrastructure of existing of broadcasting media etc. to reduce cost. Load concerning a center can be mostly made regularly irrespective of a user's increase and it becomes possible to control an additional investment of the center facility accompanying a user's increase.

[0102] Since information was compressed by the compression means according to the information providing device according to claim 10 many information can be transmitted. Therefore it becomes possible to transmit information not only including music information but Still Picture Sub-Division animation or game software etc.

[0103] According to the information providing device according to claim 11 by a multiplexing means since it was made for two or more information to multiplex several different information can be transmitted simultaneously. Therefore it becomes possible to transmit many information within predetermined time and it becomes possible from a terminal to transmit predetermined information with a Request to Send soon more.

[0104] According to the information providing device according to claim 12 since it was made for a transmitting schedule to consist of the predetermined transmission start time and sending-out finish time of a thing of the information by which the Request to Send was carried out at least with the terminal it can tell a terminal about the predetermined transmission start time and sending end time of a thing of information. Therefore it becomes possible to transmit predetermined information to a predetermined terminal certainly.

[0105] Since it was made to make information into information with the hour entry of music or an animation according to the information providing device according to claim 13 various information can be transmitted. Therefore it becomes possible for desired music movie etc. to come to hand at a house.

[0106] According to the information reception device according to claim 14 by a Request-to-Send means so that predetermined information may be transmitted to a center When a Request to Send is performed via a predetermined communication line the transmitting schedule from a center is received via a reception means and based on this transmitting schedule by an information receiving means. Since the predetermined information on a center was received to predetermined timing the terminal can acquire the predetermined information which carried out the Request to Send to the center at predetermined time. Therefore it becomes possible for the predetermined information which carried out the Request to Send to come to hand certainly at the predetermined time within predetermined time.

[0107]According to the information reception device according to claim 15by a descrambling key preparing means. The encryption scramble key from a center is descrambled based on the terminal inherent key of a terminalit is created by the descrambling keyand by a descrambling means. Since the encipherment information from a center was descrambled based on this descrambling keyonly a predetermined terminal can descramble the received encipherment information. Thereforeit becomes possible to receive predetermined information for pay.

[0108]Since according to the information reception device according to claim 16 a communication line is passed and it was made to perform bidirectional information transmission between the center and the terminal by the Request-to-Send means and a reception meansthe terminal can transmit predetermined information to a center and can receive the individual information from a center. Thereforeonly the terminal which performed the Request to Send of predetermined information becomes possible [receiving predetermined information].

[0109]Since it was made to make a transmission medium into the broadcasting electric-wave according to the information reception device according to claim 17predetermined information is receivable via the existing broadcasting media. Thereforeit becomes possible to hold down low the cost which receives information.

[0110]According to the information reception device according to claim 18a transmitting scheduleSince it was made to consist of the predetermined transmission start time and sending-out finish time of information by which the Request to Send was carried out at least with the terminalthe terminal can know the transmission start time and sending end time of the predetermined information transmitted from a center. Thereforeit becomes possible to receive certainly the predetermined information which carried out the Request to Send.

[0111]According to the information reception device according to claim 19by the recording device controlled by the control means. Since the predetermined information transmitted to predetermined transmission start time from the center is recorded according to the transmitting schedule transmitted from the center and the record was ended at predetermined sending-out finish timethe predetermined information transmitted from the center is recordable. Thereforeto a centeronly by carrying out the Request to Send of desired informationthe information can be automatically recorded on predetermined timeand a user's burden can be eased.

[0112]Since information was elongated by the extension means according to the information reception device according to claim 20the compressed information can be restored to the original information. Thereforeit becomes possible for predetermined information to come to hand in shorter timeand communication cost can be reduced.

[0113]Since it was made to make information into information with the hour entry of music or an animation according to the information reception device according to claim 21the terminal can receive various information. Thereforeit becomes

possible for desired musica movieetc. to come to hand at a house.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is a block diagram showing the composition of one working example of the music providing system which applied the information service method of this invention.

[Drawing 2]It is a block diagram showing the composition of one working example of the center which applied the information providing device of this invention.

[Drawing 3]It is a block diagram showing the composition of one working example of the terminal which applied the information reception device of this invention.

[Drawing 4]It is a flow chart which shows the Request-to-Send procedure of the predetermined music to a center from a terminal.

[Drawing 5]It is a figure showing the example of a transmitting schedule.

[Drawing 6]It is a flow chart which shows the transmission procedure of the music by a center.

[Drawing 7]It is a flow chart which shows the receiving procedure of the music by a terminal.

[Drawing 8]They are the scramble of the information in a centerand a figure showing the procedure of descrambling of the information in a terminal.

[Description of Notations]

- 1 Center
- 2 Terminal
- 3 Broadcasting satellite
- 4 Public network
- 11 Music accumulating part
- 12 Information-compression part
- 13 Scramble processing section
- 14 Multiplex processing section
- 15 Music storage device control section
- 16 Scrambler control section
- 17 CPU
- 18 RAM
- 19 ROM
- 20 Modem
- 21 System bath
- 23 Modulation processing part
- 24 Timer
- 25 Antenna
- 31 Antenna
- 32 Tuner
- 33 Multiple-signal separation part

34 Descrambler
35 Compression signal decoding part
36 Music recorder
37 Music recorder control section
38 CPU
39 RAM
40 ROM
41 Modem
42 System bath
43 Input part
44 Indicator
45 Music reproduction section
46 Timer
101102103116 CD changers
201202203216 MPEG/Audio encoder
301302303316 Scrambler
